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EXAMINER	
SAINT SURIN, JACQUES M	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/564,831	Applicant(s) STEVENSON ET AL.	
	Examiner J M. SAINT SURIN	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 21 October 2008.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al. (WO 03/019981 A2) in view of Boyko (US Patent 3,599,196).

Regarding claims 1, 24 and 30 Thomson discloses an acoustic sensor (see Figs. 2 and 3 and page 5, line 17) comprising at least one resonant element (sensor plate 30 which may be a mounted piezoelectric disc and formed of piezoelectric material, see page 5, lines 19-22);

a driver (electromagnetic field fluctuator, see page 5, line 22 and page 7, lines 30-31) comprising coupling means (capacitor of Fig. 3) and an electromagnetic field source, arranged such that, in use the coupling means (capacitor Fig. 3), transfers current to the electromagnetic field source (36) which produces an electromagnetic field (col. 5, lines 33-36) that drives the at least one resonant element (30), (see page 8, lines 6-7 and 14-16) to produce acoustic waves directed to a predetermined part of a test sample (page 7, 25 and 28); an electromagnetic detector (36, see Figs. 3-4A) arranged to receive, in use, the acoustic spectrum emitted from the test sample after the acoustic waves have interacted with the test sample (vibration of the sensor plate (30) is

evaluated by a monitoring device, not shown, which derives feedback from the coil, see page 2, lines 8-9, page 15, lines 1-8 and Figs. 2-3); and an electrical circuit (FET of Fig. 3, Fig. 4A also shows the claimed limitation) connected to the driver (fluctuator) and electromagnetic detector (coil 36), the circuit arranged, in use, to provide the current and to detect, in combination with the electromagnetic detector (36), the acoustic spectrum received by the electromagnetic detector (36) (see: Figs. 3 and 4A). However, Thompson does not particularly disclose or suggest an electrical coupling means.

Boyko discloses a plural chambered, oscillator-coaxial line resonator-detector assembly 10 (see col. 1, lines 62-65). Boyko further discloses coaxial line resonators (to meet claim 24) of the type illustrated in FIG. 2 are now generally classified "cavity" resonators (col. 2, lines 23-24). It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Thompson the coaxial line resonator of Boyko because the coaxial line resonator has a high figure of Merit (Q) which allows the oscillator to be very loosely coupled to the resonator wherein coupling of the oscillator to the resonator is controlled by the position of the oscillator tap point along the center conductor of the resonator. In addition, the coaxial line resonator or cavity can have a true coaxial construction, i.e., inner and outer cylindrical conductors with a common axis or a hybrid configuration. Therefore, the coupling should be as loose as possible within the limits imposed by the desired detection range since the loose coupling of the oscillator to the high Q coaxial line resonator circuit effectively isolates the oscillator from motion produced impedance changes in the antenna circuit thereby maintaining the frequency stability of the oscillator to make the above combination more effective.

Regarding claim 30, it is similar in scope with claim 1 and therefore, it is rejected for the reasons set forth for that claim.

Regarding claim 2, Thompson discloses a sensor according to claim 1, wherein the electronic circuit comprises an electrical oscillator (oscilloscope of Fig. 3, page 12, line 25).

Regarding claim 3, Thompson discloses a sensor (30) according to claim 1, wherein the electronic circuit comprises a frequency modulated signal generator, an AM diode detector and a lock-in amplifier (see: Fig. 3 and page 8, lines 64-col. 9, line 1).

Regarding claim 4, Thompson discloses a sensor according to claim 1, wherein the electromagnetic field source and the electromagnetic detector are the same member (coil 36, see Figs 2-4).

Regarding claims 5-8, Thompson discloses the fluctuator may comprise a coil electromagnet, such as a copper coil wire that may optionally be coated with enamel (page 10, lines 5-6 and Fig. 2).

Regarding claim 9, Thompson discloses the coil consists of enamelled copper wire (outside diameter approx. 90 .mu.m) wound into a flat spiral (approx. 4 mm diameter) on an epoxy laminate board (page 12, lines 20-21).

Regarding claim 31, Thompson discloses a method according to claim 30, wherein the at least one resonant element produced acoustic waves by electrostriction (see: page 11, lines 29-30, page 12, lines 21-22). Note that the electromagnetic field

produced by the coil 36 drives a piezoelectric element (disc) to produce acoustic waves by electrostriction.

Regarding claim 32, Thompson discloses a method according to claim 30, wherein the at least one resonant element produces acoustic waves by magnetostriction (page 11, line 29 to page 12, lines 1-2, page 17, lines 3-10).

Regarding claim 33, Thompson discloses a method according to claim 32, wherein the acoustic waves are detected by means of an electrical oscillator (page 12, line 28) tuned to the fundamental or harmonic frequency of the resonant element (page 12, lines 18-19, page 19, lines 17-19).

Regarding claim 34, Thompson discloses a method according to claim 32, wherein the acoustic waves are detected by means of a frequency modulated signal generator (page 12, lines 11-14), an AM diode detector (and page 13, lines 11-13) and a lock-in amplifier (page 12, line 29). (See also Figs. 3 and 5).

Regarding claims 10 and 16, although Thompson discloses an electromagnetic field source, it does not particularly disclose the electromagnetic field source is a microwave horn and electromagnetic detector is a microwave horn. However, the coil 36 horn performs the identical function with the microwave horn specified in the claim in substantially the same way, and produces substantially the same results as the coil disclosed in the specification. Note that the microwave horn is equivalent to the coil since both are capable of producing a radio frequency electromagnetic waves from a radio frequency current to induce the test sample of Thompson. Therefore, a person of ordinary skill in the art would have recognized the interchangeability of the coil for the

microwave horn in the above circuit to be effectively used as electromagnetic source to generate electromagnetic waves and as electromagnetic detector to detect electromagnetic waves or radiation resulting from the vibration of the resonant element of the test sample. Thus, the use of a microwave horn as electromagnetic source or electromagnetic energy in the circuit of Thompson would provide the advantages of being operable from a relatively low voltage source and which requires no magnetic field for obtaining the modulated current to induce the test sample.

Regarding claims 11-14, Thompson discloses the fluctuator may comprise a coil electromagnet, such as a copper coil wire that may optionally be coated with enamel (page 10, lines 5-6).

Regarding claim 15, Thompson discloses the coil consists of enamelled copper wire (outside diameter approx. 90 .mu.m) wound into a flat spiral (approx. 4 mm diameter) on an epoxy laminate board (page 12, lines 20-21).

Regarding claim 17, Thompson discloses a sensor according to claim 16, wherein the resonant element is metal (page 15, lines 12-13).

Regarding claim 18, Thompson discloses a sensor according to claim 17, wherein the resonant element is magnetostrictive (page 11, line 29 to page 12, lines 1-2, page 17, lines 3-10).

Regarding claim 19, Thompson discloses a sensor according to claim 16, wherein the resonant element is piezoelectric (page 13, lines 21-22).

Regarding claim 20, Thompson discloses a sensor according to claim 19, wherein the resonant element is a composite of at least two different materials (page 11, line 3 and page 11, line 3).

Regarding claim 21, Thompson discloses a sensor according to claim 20, wherein the test sample is in a gaseous phase (air and liquid) page 15, lines 10-11).

Regarding claim 22, Thompson discloses a sensor according to claim 21, wherein the resonant element is coated with a polymer layer (page 8, lines 31).

Regarding claim 23, Thompson discloses a sensor according to claim 22, wherein the test sample is in a liquid phase (page 16, lines 6-7).

Regarding claim 25, Thompson in view of Boyko discloses a sensor according to claim 24, wherein the resonant element is coated with a biorecognition layer (page 8, lines 25-26).

Regarding claims 26-29, Thompson in view of Boyko discloses a sensor according to claim 25, wherein in use, the sensor detects cells, proteins, antibodies and nucleic acids (page 8, lines 25-26, page 9, lines 1-4).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to J M. SAINT SURIN whose telephone number is (571)272-2206. The examiner can normally be reached on Mondays to Fridays between 9:30 A.M and 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron L. Williams can be reached on (571) 272-2208. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacques M SAINT SURIN/
Examiner, Art Unit 2856